The Changing Seasons and Spring Hazards
April 14, 2004

- **An initiative to raise stakeholder's awareness.**
- **Spring generally result in an increase of activity at surface coal mines, preparation plants, and at the surface areas of underground coal mines.**
- **Seasonal changes impact upon many aspects of mining activity and often results in an increase in haulage, machinery, maintenance, and other surface mining related accidents.**

Listed below are a few common hazards associated with the changing seasons:

- **Frequent freeze / thaw conditions loosen once solid rock on highwalls, road cuts and portal face ups.**
- **Structural fills of coal mine refuse, materials for constructing impoundments, and filled areas for building facilities, roads or stockpiles cannot be properly constructed of wet / frozen materials.**
- **Sudden and excessive precipitation can overcome drainage systems, damage road surfaces, plug culverts and decants, fill settling ponds and overpower designed capacities and spillways at impoundments.**
- **Wet and muddy roads, deferred berm and road repairs, damaged dump points, or compromised fill areas can pose serious operating hazards for surface haulage equipment operators and also increase maintenance demands.**
- **Muddy and adverse ground conditions accelerate wear on equipment braking systems.**
- **Haul trucks and other mobile equipment require more frequent maintenance and cleaning to maintain operator visibility. Effective equipment lighting is also problematic under wet and muddy conditions.**
- **Field maintenance is also inconvenient and difficult under such conditions.**
- **There is often an increased need for thorough pre-operating inspections and immediate corrective maintenance.**
- **Higher wind loading, greater accumulations of mud or spillage, accelerated corrosion, more frequent mechanical damage, and adverse conditions for examination and maintenance can stress aging or deteriorated structures beyond the designed limits.**

U.S. Department of Labor

MSHA

Mine Safety & Health Administration

This package provides:

A Hazard Identification and Action Plan,

A Summary of Calendar Year 2003 Fatal Mine Accidents,

and, Links to Safety Alerts, Best Practices,

and Other Relevant Resources

Action Plan

1. Each District is to exercise discretion as to the those hazards and problem areas most appropriate to the region's accident experience, existing programs and available resources.

2. The Coal Safety Division has develop national discussion points centered on the fatal accidents across the Nation. Surface haulage and machinery accidents are the historic source of serious injury accidents and public safety is most often affected by outbursts of impounded water from abandoned mines and impoundment failures. This initiative will emphasize these hazards.

3. Information for Walk and Talk initiatives during regular inspection activities will be available at the W:\Coal\1Public\Spring Initiative 2004 on MSHA LAN server and on the MSHA home page Web Cast listings. This information includes Sets of Web links to Safety Alerts, Best Practices, Fatalgrams and report, and other relevant resources sorted by surface mine type.

4. Progress reporting on the number of sites visited and miners contacted during this initiative will be posted to the W:\coal\1public location.

5. The initiative will focus on both surface supervisors and maintenance personnel and will also emphasize the importance of pre-operating inspections of mobile equipment and safe operation practices.

6. Districts are encouraged to raise stakeholder awareness of precipitation related hazards and the Agency's ongoing efforts to identify and categorize ageing or deteriorated surface structures.

What You Might Not Know

For surface area of all Mines

- From 1999 through 2003 there have been 371 fatalities in the mining industry
- 240 of these fatalities occurred on the surface (64.9% of all fatalities)
- 91 of the Surface Fatalities were haulage or machinery accidents and were 24.5% of All fatalities and 37.9% of all surface fatalities:
  - — 33 fatalities involved haul trucks (36.3% of 91)
  - — 16 fatalities involved end Loaders (17.6% of 91)
  - — 15 fatalities involved water, utility or pick-up trucks (16.5% of 91)

What You Might Not Know

For surface area of all Mines

Lack of experience contributed to many of the 91 Surface Haulage Fatalities

35 victims (38.5%) had 1 year or less mining experience

48 victims (52.8%) had 5 years or less mining experience

34 victims (37.4%) had 1 year or less job experience

50 victims (55%) had 5 years or less job experience

What You Might Not Know
For coal mines

26 surface haulage or machinery fatalities accounted for 36.1% of all surface coal fatalities;

16 fatalities involved haul trucks (61.5% of 26)

7 fatalities involved water, utility or pick-up trucks(26.9%)

12 fatalities were truck drivers (46.1%)

5 fatalities were mechanics/repairmen/electricians (19.3%)

3 fatalities were supervisors (11.5%)

What You Might Not Know

For coal mines

- 8 fatalities were from being thrown, falling or jumping from machine (30.8%)
- 7 fatalities were from driving or rolling off of bench, road or highwall (26.9%)
- 4 fatalities were from being struck or run over by machine (15.4%)
- 7 fatalities resulted from improperly maintained equipment(26.7%)
- 2 fatalities resulted from inadequate operating training (7.8%)

- 2 fatalities resulted from failure to block machinery (7.8%)

Calendar Year 2003
Fatal Accidents
All Coal Mines

Graphics include:

Synopsis of CY2003 Coal Mine Fatalities – Part 1

Synopsis of CY2003 Coal Mine Fatalities – Part 2

Fatalities by District

Fatalities by Accident Classification

Fatalities by Activity

Fatalities by Number of Mine Employees

Fatalities by Shift

Fatalities by Day of Week

Fatalities by Occupation

Fatalities by Age

Fatalities by Total Mining Experience

Fatalities by Mine Experience

Fatalities by Activity Experience

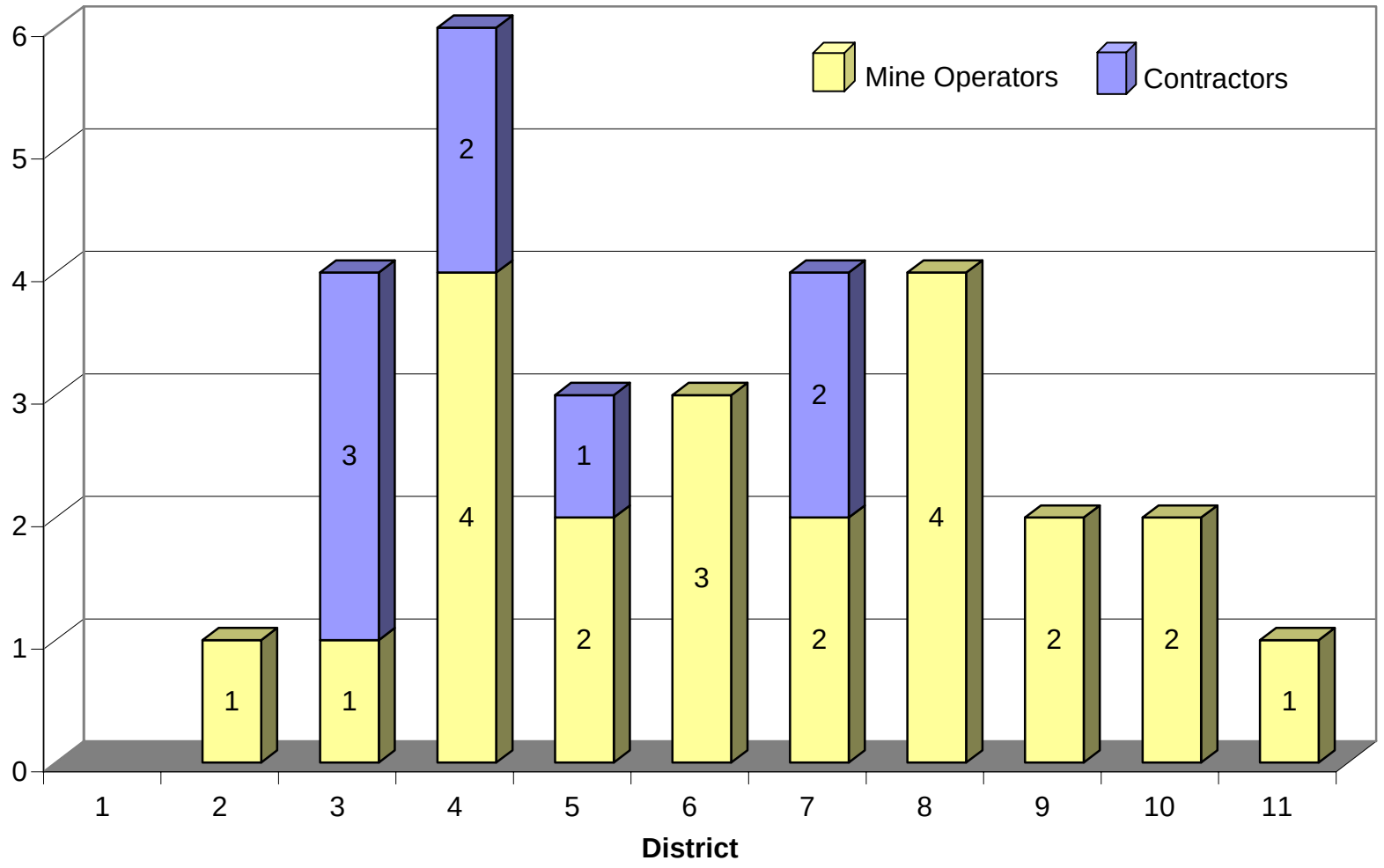
Synopsis of CY2003 Coal Mine Fatalities
Part 1

- 30 fatalities have occurred in CY03.
- 10 fatalities (36%) involved maintenance and construction activities.
- 4 fatalities (18%) involved cutting or welding.
- 16 fatalities (50%) occurred in Tri-State districts.
- 57% of the fatal victims had more than 10 years total mining experience, but 33% had less than one year of experience at the mine where the accident occurred.
- 47% of the fatalities occurred at mines with more than 100 employees, 30% at mines with less than 20 employees.
- 60% of the fatal accidents occurred on day shift, 17% afternoon, and 23% midnight.
- 8 (27%) of the fatal victims were supervisors.

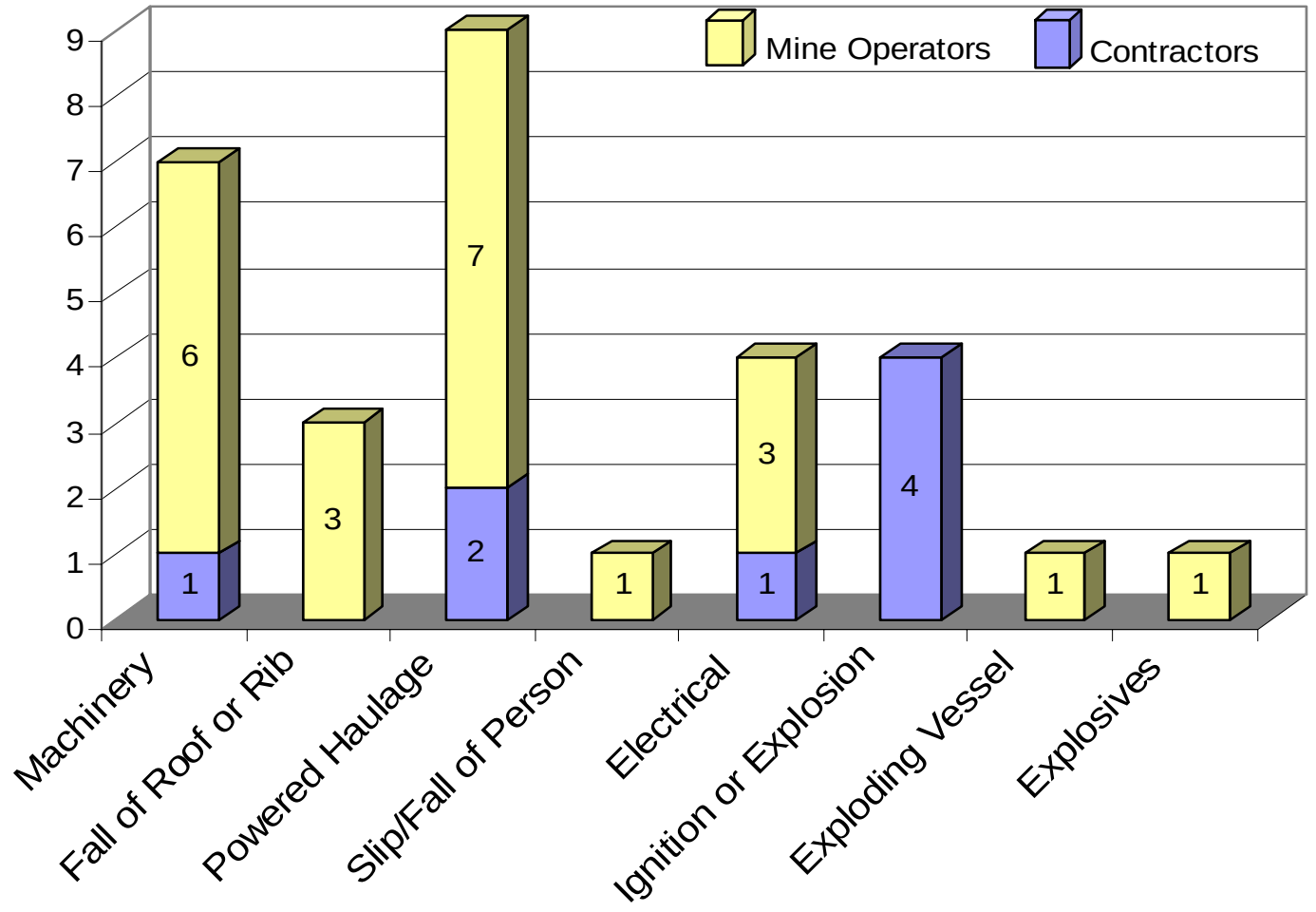
Synopsis of CY2003 Coal Mine Fatalities Part 2

- 5 fatalities involved ignitions of gas or fluids:
  - Fatals 1-3: Methane explosion while cutting into water ring during shaft construction;
  - Fatal 12: Pressurized can of starting fluid ignited and ruptured when it contacted a battery terminal while being used to clean dust and oil from engine-mounting bolts;
  - Fatal 23: Explosion of 55-gallon drum while being filled with acetylene.
- 3 accidents involved explosives:
  - Fatal 13: Foreman used a power center to detonate explosives;
  - Fatal 15: Three miners were injured, one fatally, when a shot unexpectedly blew through into the area where they were taking shelter from the blast.
  - Non-injury Ignition: Methane accumulated in a roof fall cavity and was ignited when explosives, which were placed on the fallen roof material, were detonated.

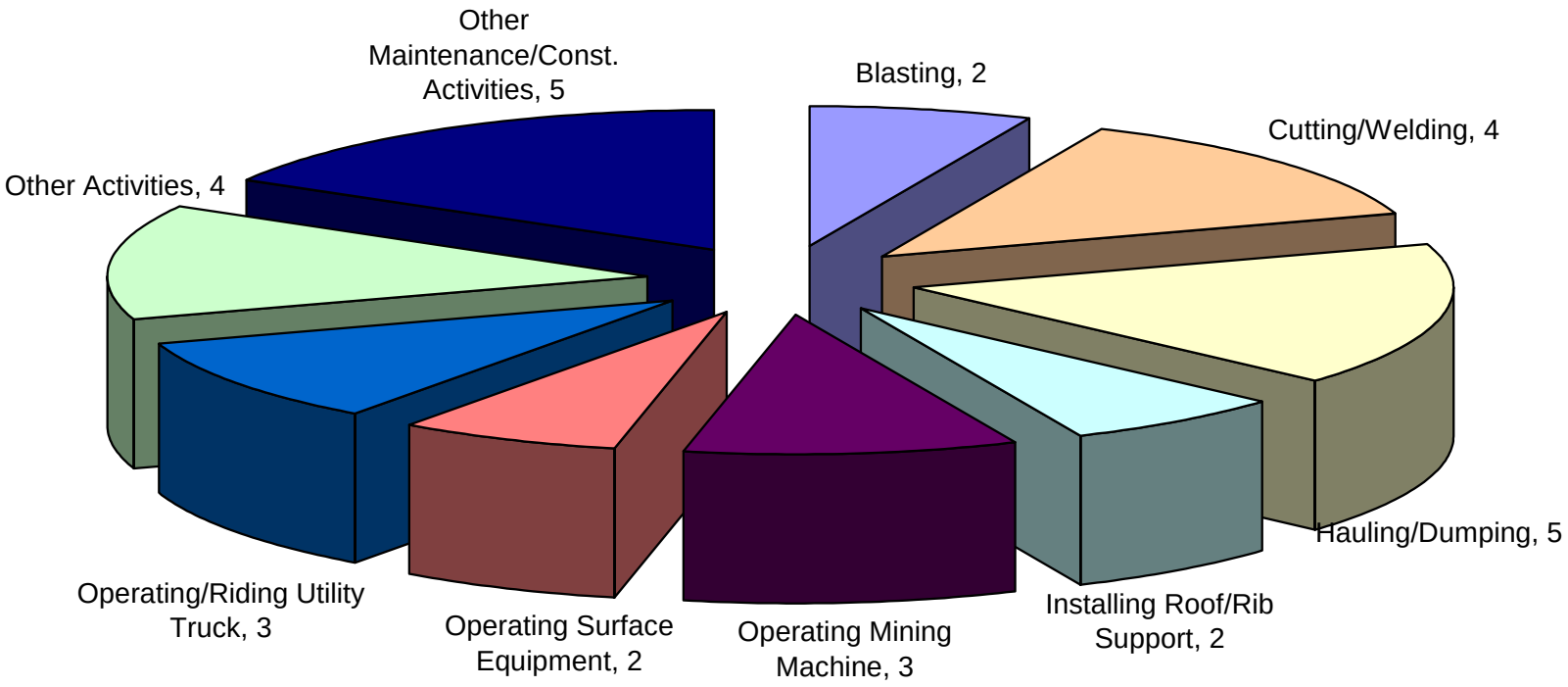
Coal Mine Fatalities by District
CY 2003



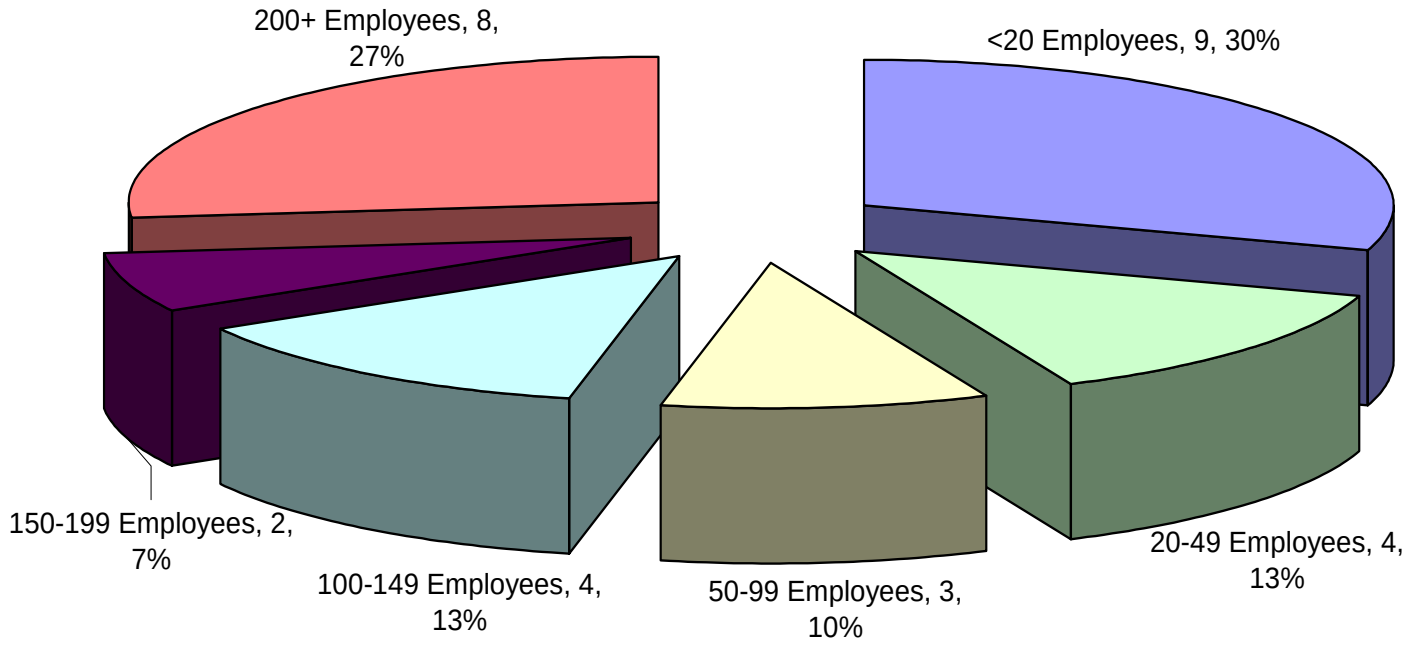
Coal Mine Fatalities by Accident Classification
CY2003



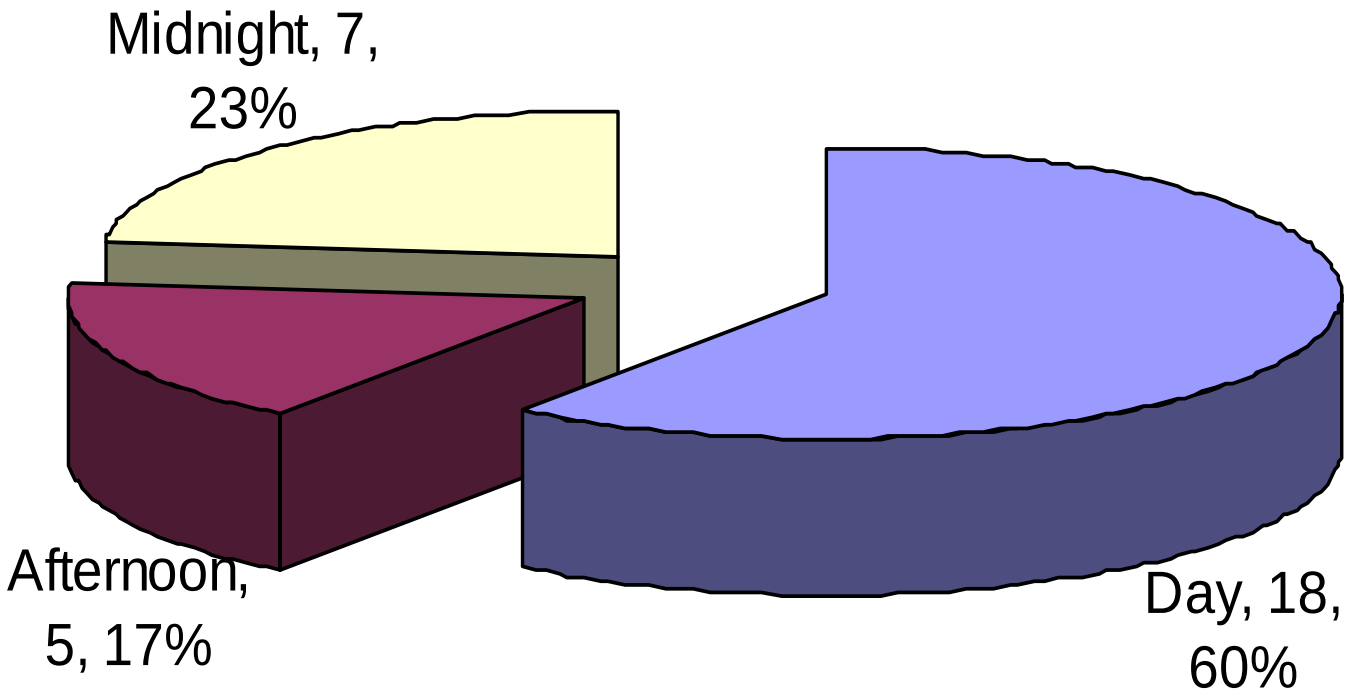
Coal Mine Fatalities by Activity
CY2003



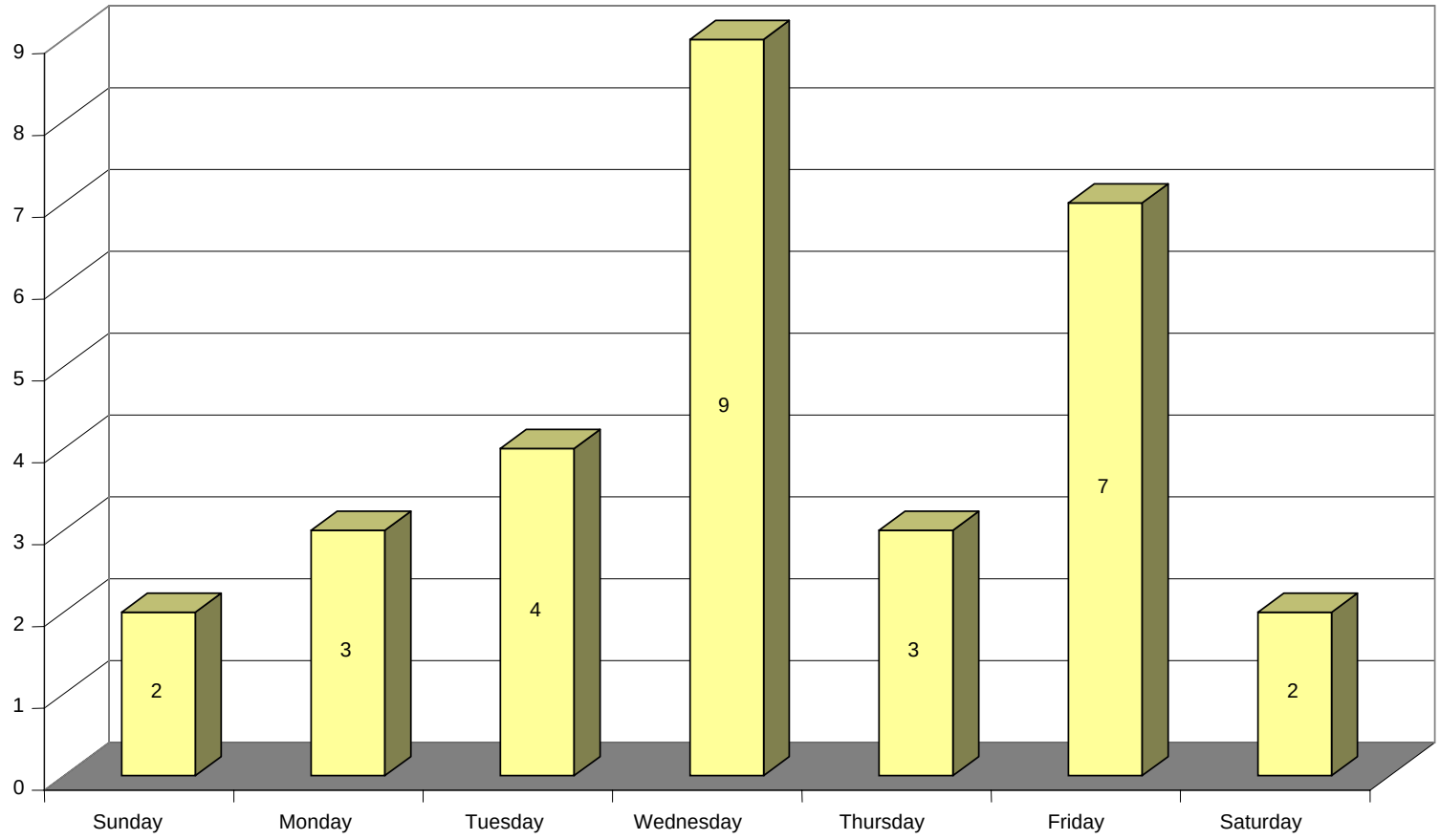
Coal Mine Fatalities
By Number of Employees
CY2003



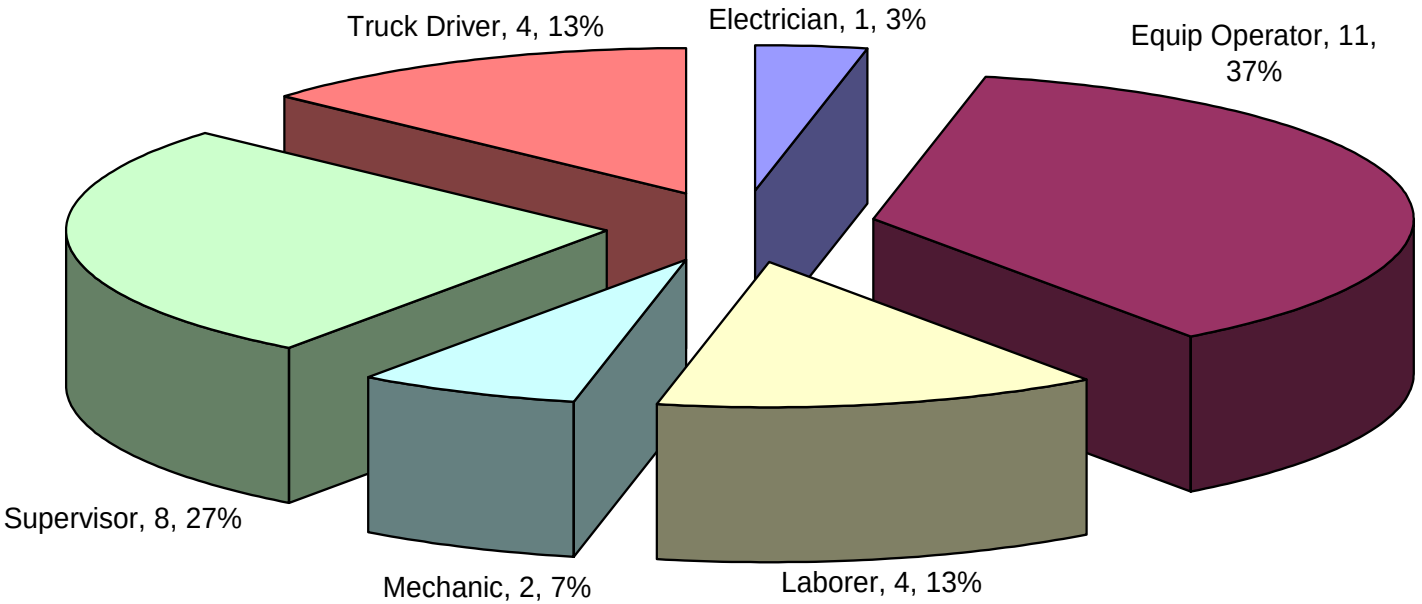
Coal Mine Fatalities By Shift
CY2003



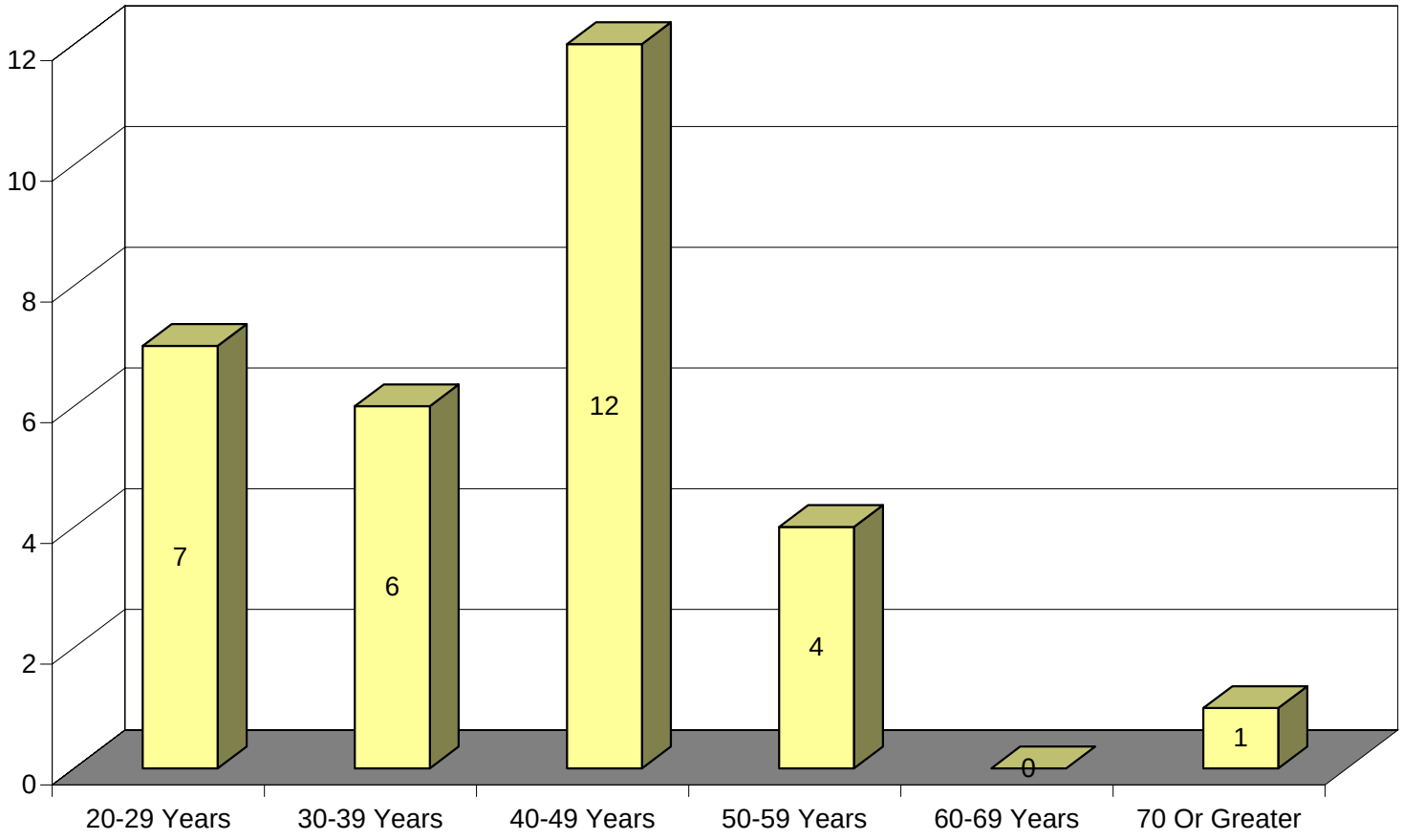
Coal Mine Fatalities by Day of Week
CY2003



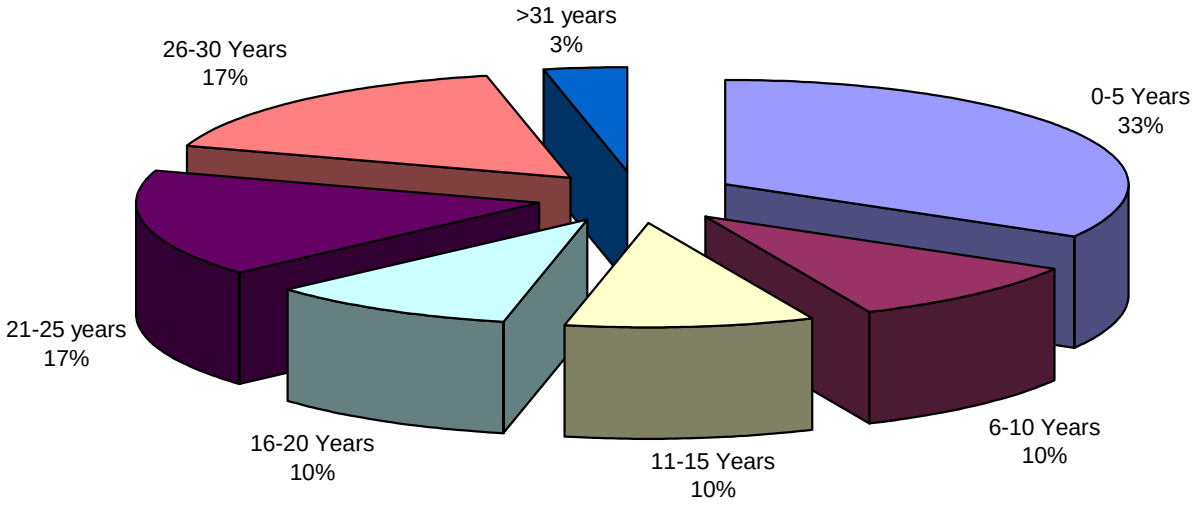
Coal Mine Fatalities By Occupation
CY2003



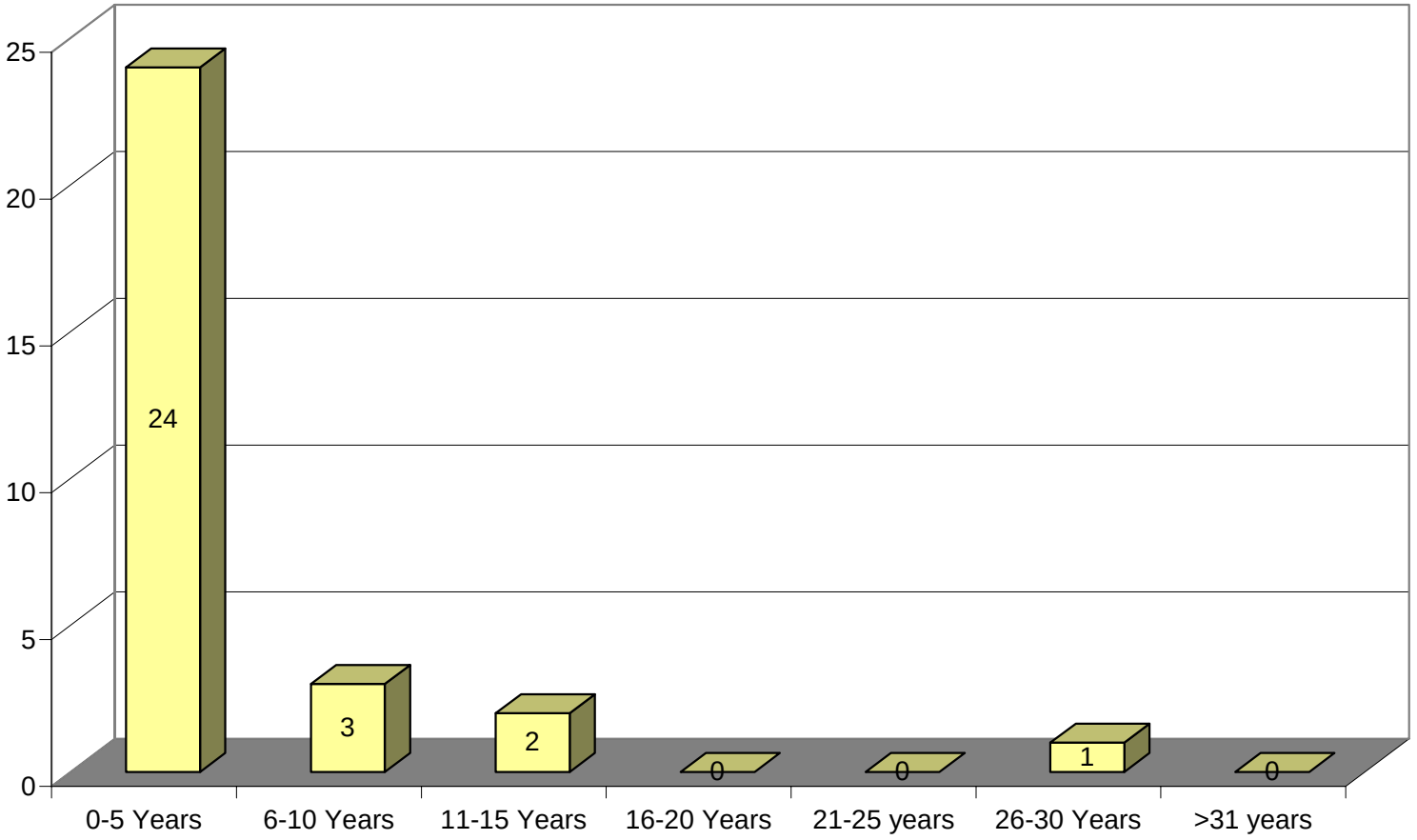
Coal Mine Fatalities By Age
CY2003



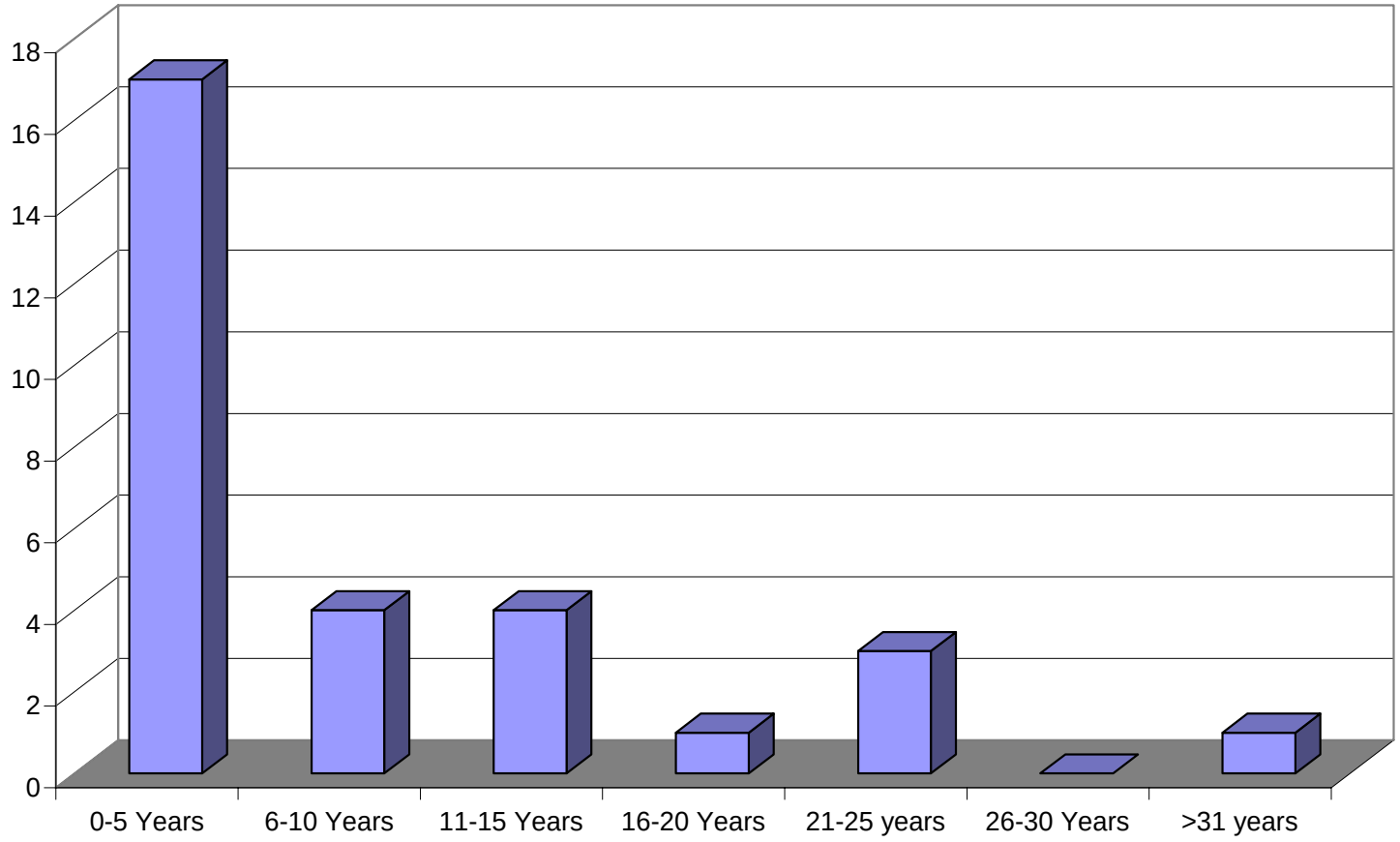
Coal Mine Fatalities By
Total Mining Experience
CY2003



Coal Mine Fatalities by Mine Experience
CY2003



Coal Mine Fatalities By Activity Experience
CY2003



COAL DAILY FATALITY REPORT - April 6, 2004

FATALITIES CHARGEABLE TO THE COAL MINING INDUSTRY	2000		2001		2002		2003		2004	
	UG	S	UG	S	UG	S	UG	S	UG	S
ELECTRICAL	0	1	0	1	1	0	2	0	1	0
EXP VESSELS UNDER PRESSURE	0	0	0	0	0	1	0	0	0	0
EXP & BREAKING AGENTS	0	0	0	0	0	0	0	0	0	0
FALL/SLIDE MATERIAL	0	0	0	0	0	0	0	0	0	1
FALL OF FACE/HIGHWALL	1	0	0	0	0	1	1	0	0	0
FALL OF ROOF/BACK/RIB	0	0	2	0	3	0	0	0	0	0
FIRE	0	0	0	0	0	0	0	0	0	0
HANDLING MATERIAL	0	0	0	0	0	0	0	0	0	0
HAND TOOLS	0	0	0	0	0	0	0	0	0	0
NONPOWERED HAULAGE	0	0	0	0	0	0	0	0	0	0
POWERED HAULAGE	0	2	1	0	1	1	1	2	1	1
HOISTING	0	0	0	0	0	0	0	0	0	0
IGNITION/EXPLOSION OF GAS/DUST	0	0	0	0	0	0	3	0	0	0
INUNDATION	0	0	0	0	0	0	0	0	0	0
MACHINERY	1	1	0	0	1	0	0	0	2	1
SLIP/FALL OF PERSON	0	1	0	1	0	0	0	1	0	0
STEP/KNEEL ON OBJECT	0	0	0	0	0	0	0	0	0	0
STRIKING OR BUMPING	0	0	0	0	0	0	0	0	0	0
OTHER	1	0	0	0	0	0	0	0	0	0
YEAR TO DATE TOTALS	3	5	3	2	6	3	7	3	4	3
COMBINED YEAR TO DATE TOTALS	8		5		9		10		7	
END OF YEAR TOTAL	38		42		27		30			

NONCHARGEABLE FATALITIES	2000	2001	2002	2003	2004
NATURAL CAUSES	4	6	4	5	0
HOMICIDE/SUICIDE	0	1	0	0	0
TRESPASSER	3	0	0	0	1
PENDING CHARGEABILITY REVIEW	0	0	0	0	4
OTHER	0	0	0	0	0
YEAR TO DATE TOTALS	7	7	4	5	5
END OF YEAR TOTALS	17	24	14	19	

COAL MINE FATALITY - On Saturday, January 3, 2004, a 44-year old longwall shearer operator with 26 years of mining experience was fatally injured while attempting to advance a longwall shield. The longwall face was being mined through a setup room containing cementatious "cutable" cribs. These cribs failed, causing many of the shields to fully collapse. To advance the longwall, chains were attached from the collapsed shields to the panline. Using two adjacent shields to push the panline, the collapsed shield was pulled forward with the attached chains and the shield's double-acting ram. Miners were positioned on each of the three affected shields to manually operate them. During this process, the chain hook broke. The remaining part of the hook and the chain assembly recoiled, striking the miner operating the collapsed shield in the head.

Best Practices

- Ensure that chain assemblies (rigging) are rated for the loads being pulled. Consult the chain manufacturer to determine chain assembly rated capacities and also required de-ratings due to the geometry of the final rigging arrangement.
- Ensure persons are positioned in a safe location before tension is applied when dragging or towing equipment with chains, wire rope, or any other rigging.
- Ensure that chains and hooks are properly attached or rigged.
- Evaluate pillar strength and design before second mining areas containing unusual circumstances, such as setup rooms.

COAL MINE FATALITY - On Thursday, January 22, 2004, at approximately 11:00 p.m., a 29-year-old laborer with seven years experience was fatally injured on the surface of an underground coal mine. The victim was operating an Eimco 975 diesel-powered utility vehicle to obtain a water tank trailer when he collided with the canopy of a longwall shield that was stored in the supply yard. The collision resulted in fatal injuries. The utility vehicle was not equipped with a protective cab or canopy.

NOTE: The shield is shown after being rotated about 60º after the accident.

Best Practices

- Ensure that surface work areas are sufficiently illuminated at night so that obstacles can be clearly seen.
- Equipment operators should always look in the direction of movement.
- Design and arrange equipment storage yards to provide safe access and egress.
- Equipment operators should be aware of their surroundings and any potential hazards.
- Routinely monitor work habits and examine work areas to ensure that safe work procedures are being followed.
- In addition to mandatory applications, consider providing protective cabs, canopies, or vertical intrusion shielding pipes on mobile equipment whenever mining height permits.

COAL MINE FATALITY - On Thursday February 5, 2004, a 33-year old electrician with six years mining experience was fatally injured while repairing a damaged 995 volt trailing cable. During a mine-wide power outage, the victim began repairing a damaged continuous mining machine trailing cable. While preparing to splice the third and final power phase, underground electrical power was restored and the electrical circuit breaker was engaged in the closed position causing a fatal electrical shock. The continuous mining machine trailing cable plug was not tagged or locked out.

Best Practices

- Personally lock-out and tag-out electrical circuits before you perform electrical work on a cable or component.
- Do not rely on someone else to ***deenergize*** or disconnect a circuit for you.
- Never assume that a circuit breaker will not be reset - even if there is no apparent reason for resetting the breaker.
- Never disturb or ignore an electrical tag or lock.
- Thoroughly communicate to determine that it is appropriate to reset a breaker.

COAL MINE FATALITY - On Tuesday February 10, 2004, at approximately 7:35 a.m., a 25-year old roof bolting machine operator with 7 years mining experience was fatally injured while operating a battery-powered track-mounted personnel carrier. The personnel carrier, transporting the victim and six other miners, had just entered the track portal through an open airlock door when it lost traction and began sliding down grade. The vehicle traveled approximately 139 feet before crashing through the closed inby airlock door. After traveling an additional 186 feet, the vehicle derailed and came to a stop. The victim received fatal injuries when struck by the door. The six passengers were uninjured.

Best Practices

- Avoid placing doors, switches, and other installations in haulageways where significant grades exist.
- Ensure that sanding devices contain adequate sand and are working properly before operating track mounted equipment.
- Exercise caution when approaching grades and operate track-mounted equipment at speeds consistent with grades and track conditions. Remember, as your speed increases, your ability to stop without sliding decreases and, once you start sliding, it becomes even more difficult to stop.
- Install haulageway doors such that they can be opened on the fly without the need to stop and exit the equipment.
- Ensure dead-man controls fail safe and do not neutralize brakes or dynamic retarding controls.

COAL MINE FATALITY - On Tuesday, March 2, 2004, a 50-year old maintenance foreman with 31 years of mining experience was fatally injured when a coal stockpile collapsed as he directed work to prepare for the replacement of an underground feeder. A dozer removed coal stockpiled above the feeder, creating 58-foot high coal banks on both sides of the exposed feeder chute opening. The victim then stood near the chute and directed a front-end loader to maneuver a steel plate over the opening so that the feeder could be accessed from below. Immediately after the plate was placed over the feeder, the right coal bank partially collapsed. The victim was knocked down and covered with approximately three feet of coal.

Best Practices

- Evaluate each step in the work process for potential hazards before starting work.
- Train employees in established safe work procedures, then ensure that they are complied with.
- Position employees to prevent them from being exposed to hazards.
- Examine work areas during the shift for hazards that may be created as a result of the work being performed.
- Always remember: Any nconsolidated material sloped above its natural angle of repose is, by definition, UNSTABLE and potentially DANGEROUS.

Spring Hazard Identification

- **Hazards associated with the changing seasons and the coming of spring impact surface mines and surface facilities with little regard to the commodities being mined.**
- **Surface mining has shown itself to be significantly safer than underground mining, both in terms of accident frequencies and severities.**
- **Surface mining has contributed an ever greater share to total coal production so has its contributed to the overall industry accident injury experience increased.**
- **Consequently, significant opportunities to reduce fatalities and injuries exist in emphasizing the safe operation and maintenance haul trucks, water trucks, rubber tired end loaders and other surface mining machinery.**

Frequent freeze / thaw loosen once solid rock on highwalls, road cuts and portal face ups.

Heightened awareness by mine managers and MSHA inspectors and special attention to work area examination, immediate isolation and marking of hazard areas and removal of loosened material are a must for safety.

Structural fills of mine refuse, fills for constructing impoundments, and fills on which to build facilities, roads or stockpiles cannot be properly constructed of wet / frozen materials and are loosened by frequent freeze / thaw.

Mine inspectors and mine managers must look to the long term safety of the mines and public and assure the designed requirements for the placement and compaction of fill materials as outline in approved plans and good engineer practice are being satisfied. Heavy precipitation can and should necessitate suspending refuse disposal and construction of structural fills.

Muddy roads, deferred repairs or construction of berms, damaged dump points or fill areas compromised by thawing of frozen fill or excess moisture can pose serious operating hazards for haulage equipment. These conditions also increase maintenance demands when field maintenance is inconvenient and difficult. Muddy roads and clogged ditchers are not "just" an inconvenience, they can be killers.

Mine management and MSHA must assure road are safe for travel. Travel frequency and speed must be reduced when ever and wherever road maintenance is needed or underway. Higher designed road gradients are more seriously impacted by bad weather and delayed or inadequate road maintenance and any equipment operation must recognize the increased difficulty in maintaining control. Again, further reductions in traffic and speed may be the only practical action while and until road conditions are improved.

Pre-operating examinations of mobile equipment and repairs of equipment are complicated by bad weather and accumulations of mud. Frequently repairs must be made in the field and under extremely adverse conditions.

MSHA inspectors and mine managers must continually emphasize the need to plan work and prepare work sites so that repairs can be made efficiently and safely. Some delay in stating work is far better than injuries or poorly executed repairs.

Haul trucks experience increased wear braking systems and serious degradation of operator visibility due to mud spatter on windshields, head lights, and brake and tail lights. Falling hazards associated with mounting and dismounting trucks to place tarps and/or conduct other activities, increases where roads and step surfaces are muddy.

MSHA inspectors and mine management must emphasize frequent periodic brake inspection and continuous removal of mud spatter to equipment operators and contract haulers as and essential part of an effective safety program. Stations for cleaning windshields and lighting systems or to remove accumulated mud before trucks return to public highways may be necessary where road maintenance cannot fully address the problem.

High winds, heavy precipitation and accumulations of mud or spilled coal all contribute to overloading mine structures such as conveyor galleries, preparation plants, transfer towers and storage facilities. In addition, poor weather often delays or inhibits good house keeping, accelerates corrosion and increases mechanical damage by equipment operators. The preceding can erode design safety factors to the point of structural failure. MSHA inspectors and mine management are the first line defense in identifying deteriorating structure and assuring appropriate repairing are made before structures fail.

Mine examiners must concern themselves with reporting and correcting excessive loading , mechanical damage, cracked or failed welds, missing fastener \ broken nuts and bolts, excessive rust / corrosion, cracked or damaged concrete foundations and floors or masonry or poured walls. While structural failures are rare, the potential for serious injury and death are very real.

None of these areas of concern are new or entirely unique to spring. However, taking these preventative actions can be an opportunity for mine operators and MSHA to work together in preventing injury accidents, improve mine examination and maintenance practices and prevent serious production delays.

The Safety Division has prepared a series of web site links to access information for:

Strip / Surface Mines
Preparation Plants
Surface facilities at Underground Mines
Auger / Highwall Miner Operations, and
Impoundments

(See W:\Coal\1Public\Spring Initiative 2004)